

Evaluation of Hypertensive Patients with General Health Questionnaire

Hipertansif Hastaların Genel Sağlık Anketi ile Değerlendirilmesi

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ABSTRACT Objective: Hypertension is still have high morbidity and mortality due to the difficulty in management. In this study we tried to evaluate the sociodemographic variables and psychological status of hypertensive patients. **Material and Methods:** 111 patients with the diagnosis of essential hypertension included in the study. A meeting questionnaire with 31 questions for evaluating sociodemographic variables, comorbid diseases, duration of hypertension, risk factors and level of physical activity was used in the study. General health questionnaire-28 (GHQ-28) for evaluating the psychological status was applied to each patient. **Results:** 61% of the patients was in the age group of 41-60 years, most of the patients were female (65%), housewife (50%), married (94%), belonged to nuclear family (69%) and never consumed alcohol (88%). Complete or incomplete elementary education level was most prevalent occurring 56%. Majority of the patients were under medical treatment (93%), 45% of the patients was involved in physical activity, 59% of them had stressful life events. Average GHQ-28 item score was 6.6 ± 6.2 . GHQ-28 score was significantly higher in the females and patients who had stressful life events (7.7 ± 6.2 $p=0.01$ and 8.3 ± 6.5 $p<0.001$ respectively). **Conclusion:** One of the factor that should be included in hypertension management is psychological status of the patients. The use of GHQ-28 in this study suggested that this instrument may be used in the hypertension clinics.

Key Words: Hypertension; demography

ÖZET Amaç: Hipertansiyon kontrol altına alınabilmesi hala oldukça güç olması sebebiyle toplumda yüksek morbidite ve mortaliteye sebep olmaktadır. Çalışmamız hipertansif hastaların sosyo-demografik özelliklerinin ve ruhsal durumlarının değerlendirilmesi amacıyla planlanmıştır. **Gereç ve Yöntemler:** Çalışmaya hipertansiyon tanısı almış 111 hasta alınmıştır. Hastaların sosyodemografik özellikleri, eşlik eden hastalıkları, mevcut risk faktörleri, hipertansiyon süresi ve fiziksel aktivite düzeylerini belirlemek amacıyla 31 soruluk Görüşme Formu ile birlikte ruhsal durum değerlendirilmesi amacıyla da Genel Sağlık Anketi-28 (GSA-28) kullanılmıştır. **Bulgular:** Araştırmamıza katılan hastaların %61'i 41-60 yaş aralığında, çoğunluğu kadın (%65), evhanımı (%50), evli (%94), çekirdek aileye mensup (%69) ve hayatında hiç alkol kullanmamış (%88) idi. Hastaların çoğunluğunun eğitim düzeyi ilkökul seviyesinde (%56) ve %93'ü medikal tedavi altında idi. %45'i egzersiz yaptığını ifade etti. Hastaların %59'u psikolojik durumlarını etkileyebilecek olumsuz bir durum ile karşılaştıklarını belirtti. Hastaların GSA-28 skoru ortalaması 6.6 ± 6.2 olarak bulundu. GSA-28 puanı kadınlarda ve yaşamı etkileyen olumsuz durumu olan hastalarda anlamlı olarak yüksek saptandı (sırası ile, $7,7 \pm 6,2$ $p=0,01$ ve $8,3 \pm 6,5$ $p<0,001$). **Sonuç:** Araştırmada hipertansif hastaların tedavisinde göz önüne alınması gereken parametrelerden birinin de stres faktörü olduğu ve hipertansif hasta değerlendirmesinde genel sağlık anketi kullanılmasının yerinde olabileceği sonucuna ulaşıldı.

Anahtar Kelimeler: Hipertansiyon; demografi

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Hypertension is an important public health problem accounting for about 6% of deaths worldwide.¹ As much as 1 billion people have hypertension worldwide and 7.1 million deaths a year may be attributable to hypertension.^{1,2} High blood pressure is responsible for 62% of cerebrovascular disease and 49% of ischemic heart disease.³

Hypertension is also an important public health threat in Turkey. Turkey has a high prevalence figure of hypertension: age -and sex- adjusted prevalence was 31.8% (27.5% for men and 36.1% for women).⁴ Overall control rate was only 13.6% in the whole hypertensive population and it was 27.3% for the ones who were on antihypertensive treatment.⁵

There are several risk factors for the occurrence of hypertension, the non-modifiable ones such as age, gender, race and family history, and the modifiable, such as smoking, unbalanced diet, diabetes, obesity, sedentary lifestyle, emotional stress, use of contraceptive drugs, among others.

Accumulating evidence suggests that psychosocial factors including depression, anxiety, stress, lack of social support/social integration, low socio-economic status, and occupational stress be associated with hypertension, that psychosocial factors might independently predict subsequent cardiovascular events or complications and comorbidity.^{6,7} An increasing number of studies have implied that psychosocial factors play an important role in the pathogenesis of hypertension.

This study was conducted to evaluate the sociodemographic variables and psychological status of hypertensive patients that might have an impact on the success of the therapy.

MATERIAL AND METHODS

The study included 111 hypertensive patients (72 females and 39 males) that applied to five primary health centers in the city of Sakarya and a university student health center clinic in Sakarya University, Turkey. Sakarya University Ethics Committee approved the study protocol and each subject were informed consent prior to enrollment.

Then patients were asked to complete a sociodemographic data form and General Health Questionnaire-28 before their visit with the primary care physician.

Hypertension was defined according to seventh report Joint National Committee for detection, evaluation and treatment of high blood pressure, as systolic BP more than or equal to 140 mmHg or diastolic blood pressure more than or equal to 90 mmHg or those individuals currently taking antihypertensive treatment.²

The following tools were used:

GENERAL SOCIODEMOGRAPHIC QUESTIONNAIRE

An assistant collected the self-administered questionnaires. The following information was included: demographic and clinical data for gender, mean age, height, weight, body mass index (BMI), marital status, education, current smoking habit, occupational status, history of hypertension, personal medical history, lifestyle, medications used.

GENERAL HEALTH QUESTIONNAIRE-28 (GHQ-28)

The General Health Questionnaire is the most widely used screening instrument for detecting psychiatric disorders in community and non-psychiatric clinical settings.⁸ GHQ was developed by Goldberg⁹ in 1972 and adapted to Turkish on the adult people who applied to a primary health care service by Kilic⁸ in 1996.

The 28-item version of the GHQ (GHQ-28) was used in this study. In the GHQ-28 the respondent is asked to compare his recent psychological state with his usual state. It is therefore sensitive to short-term psychiatric disorders but not to long-standing attributes of the respondent. All items have a 4- point scoring system using GHQ scoring (0-0-1-1). The GHQ-28 contains 28 items that, through factor analysis, have been divided into four sub-scales.

The four sub-scales, each containing seven items, are as follows:

- A . somatic symptoms (items 1-7)
- B . anxiety/insomnia (items 8-14)
- C . social dysfunction (items 15-21)
- D . severe depression (items 22-28)

The Turkish (adaptation) translation of the GHQ was used with a cut-off score for case of 5, at which level the questionnaire has a reported sensitivity of 74 percent and specificity of 70 percent.⁸ The User's Guide for the GHQ recommends that the best threshold score is determined in each country or setting in which it is intended to be used.⁹ Kilic (1996) has reported sensitivity of 73.7 percent for cut-off point of 5. Therefore, cut-off point of 5 was used in this study, implying that a patient who has a score of >5 is defined as having psychiatric morbidity.

STATISTICAL ANALYSIS

Continuous variables were expressed as mean±SD. Categorical variables were expressed as percentages. Statistical analyses were performed by using SPSS packed programme (version 11,5 software, SPSS Inc. Chicago, Illinois, USA). Parameters visualized in a histogram and analyzed one sample kolmogorow-smirnow test resembled a normal distribution. Evaluation of the data, frequency tables, center and the prevalence with the criteria of Pearson's correlation test, one way ANOVA and student's t-test for independent samples was used.

RESULTS

Clinical and demographic characteristics of the patients were shown in Table 1. Mean height, weight and BMI of the patients were 164.2±8.2 cm, 81.5±12.0 kg and 29.8±4.3 respectively.

According to Figure 1 the results showed that 20 (18%) of the patients indicated that they were smoking tobacco with a higher proportion (55%) who smoked more than 10 cigarettes per day.

Thirty-four percent of the patients had hypertension more than 10 years, 61% were checking their blood pressure after a complaint that might reflect uncontrolled hypertension and 48% were going to a hospital after such a complaint.

Seventy percent of the patients under pharmacological treatment due to other diseases, the most frequent was cardiopulmonary diseases (33%) (Table 2).

TABLE 1: Clinical characteristics of the patients.

Variable s	Category	Frequency	Percent
Age (Years)	21-40	8	7
	41-60	68	61
	61-80	33	30
	>80	2	2
Gender	Male	39	35
	Female	72	65
Marital status	Married	104	94
	Single/widowed/divorced	7	6
Education	Illiterate	9	8
	Elementary	62	56
	Higher education	23	21
	Medium level	17	15
Occupation	Housewife	55	50
	Government employee	26	23
	Retired	21	19
	Others	9	8
Family type	Nuclear	77	69
	Joint	34	31
Alcohol use	No	98	88
	Yes	13	12
Physical activity	No	61	55
	Yes	50	45
Physical activity lenght/day	<1 hour	32	64
	1-2 hours	16	32
	>2 hours	2	4
Antihypertensive medication	No	8	7
	Yes	103	93
Adherence to medication	No	3	3
	Yes	100	97
Stressful life events	No	46	41
	Yes	65	59

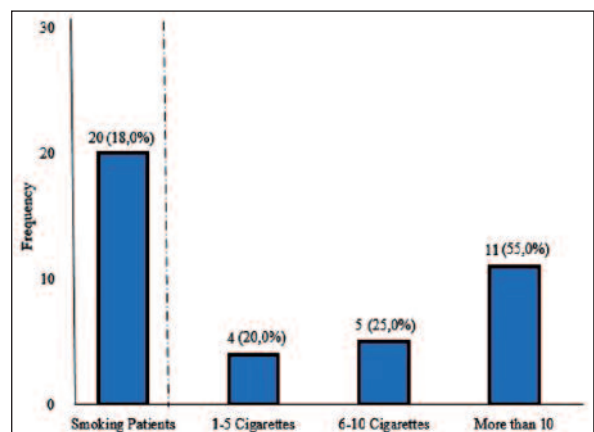


FIGURE 1: Frequency distribution of cigarette smoking and number of cigarettes per day.

TABLE 2: Pharmacological treatment due to other diseases.

	Frequency	Percent
Medication		
No	33	30
Yes	78	70
CPD	26	33
ND	12	15
ED	17	32
CPD+ND+ED	18	23
Analgesic	5	26

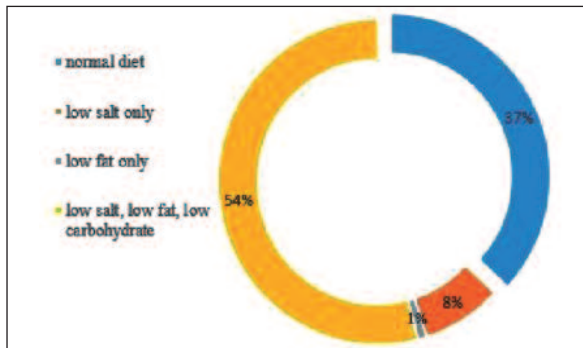
CPD: Cardiopulmonary diseases; ED: Endocrine diseases; ND: Neurological diseases.

Participants were asked about their dietary and eating practices. The results showed that most of them (54%) indicated taking low salt, low carbohydrate and low fat diets, while 37% were taking a normal diet as shown in Figure 2.

Average GHQ-28 item score in the overall sample was 6.6 ± 6.2 . GHQ-28 score was significantly higher in the females and patients who had stressful life events (Table 3).

DISCUSSION

In our study, we observed an elevated risk of psychological distress in patients with hypertension.

**FIGURE 2:** Distribution of patients' dietary practices.**TABLE 3:** GHQ scores of the patients.

Variables			P value
Stressful life events	8.3±6.5 (yes)	4.3±4.8 (no)	<0.001
Gender	7.7±6.2 (female)	4.6±5.7 (male)	0.01

The study revealed that females and those who have stressful life events are more at risk of psychiatric morbidity. The risks of these comorbidities often complicate the course of hypertension and may further lead to increased morbidity and mortality among patients. The knowledge about associated psychopathology may aid in improving early detection and optimal patient care.

Studies examining the association of hypertension with psychological distress, such as anxiety and depressive symptoms, have produced mixed findings. Several studies have reported positive associations, whereas others have observed weak or no associations.

Previous works suggest that anger, anxiety, and depression are predictors of hypertension.^{10,11} Rutledge and Hogan found that the risk of developing hypertension was approximately 8% higher among people who had psychological distress compared with those who had minimal distress.¹² The National Health and Nutrition Examination Survey and the Framingham study revealed that high levels of symptoms of depression and anxiety were associated with an increased risk of developing hypertension.^{13,14} Considerable stress or stress life events, lack of social support/social integration, and low-economic status were likely to accompany the hypertensive patients.¹⁵⁻¹⁸ Waldstein and colleagues¹⁹ demonstrated that hypertensive individuals had a lower psychological function than normotensive individuals. Other studies also showed the prevalence rates of depression and anxiety as high as 36.4% and 39.4%, in female and 32.2% and 27.4% in male hypertensive patients respectively.^{15,16} The higher blood pressure in anxious individuals could reflect a chronic state of psychological arousal in these subjects, which is typically accompanied by increased sympathetic nervous activity and decreased parasympathetic activity. At the cardiac level, the shift in sympathovagal balance leads to an increase in cardiac output; at the vascular level, the increased norepinephrine drive may further increase the peripheral resistance. Both effects can, in principle, explain the increase in blood pressure. Moreover, normotensive children of hypertensive parents also have elevated

tion in blood pressures as a response to emotional stress almost without exception.²⁰

Diagnosis of hypertension itself rather than elevated BP might partly explain the elevated risk of psychological distress in patients treated for hypertension. Several studies have demonstrated higher psychological distress and lower well being in labeled hypertensives and mislabeled normotensives in comparison with unaware hypertensives.²¹ Act of labeling somebody as hypertensive can cause increases in sympathetic activity during mental stress^{22,23} which might partly explain the associations with worse mental health.

Other studies, however, have not found an association between depression and hypertension.^{24,25} Simonsick et al. have not found an association between depression and hypertension.²⁶ In the CARDIA study, a positive association was described for black participants only when the 160/95mm Hg criterion was employed to diagnose hypertension.²⁷ In a more recent report, however, depressive symptoms were not associated with the incidence of hypertension.²⁸ Licht et al. showed that depressive disorder was associated with low systolic blood pressure and less hypertension, whereas the use of certain antidepressants was associated with both high diastolic and systolic blood pressures and hypertension.²⁹

Psychosocial distress associated with decreased likelihood of achieving the goal of blood pressure lowering during anti-hypertensive treatment.³⁰ The mechanisms responsible for the impact of psychosocial distress on the therapeutic effect of anti-hypertensive treatment are complex and not fully understood. Increased and persistent sympathetic

activity, increased BP reactivity and stimulation of hypothalamic-pituitary-adrenal axis were associated with increased BP in individuals with hypertension and psychosocial distress^{31,32} which might explain the reduced positive outcome for anti-hypertensive medication in patients with modestly controlled BP. Higher levels of psychosocial distress were likely to result in a decreased adherence to physician recommendations on medications and lifestyle.

Psychological factors could partially account for poor hypertension control through the existence of personality traits related to treatment compliance (e.g., self-discipline, deliberation, impulsiveness), and the fact that stress and some personality traits (e.g., anxiety, depression, anger expression, type A) are involved in the etiology of some hypertension cases.³³

Our study had certain limitations. Subjects for the study were chosen from a single locality and thus may not be representative of population throughout Turkey.

In conclusion, it was found that hypertensive patients had psychological symptoms according to GHQ-28. Early diagnosis and treatment of these psychological symptoms may improve hypertension treatment. The relationship between hypertension and mood disorders should inform a higher index of suspicion among physicians and general practitioners in order to give patients appropriate treatments or referrals where necessary. In addition, the use of GHQ-28 in this study which is a self-administered instrument suggested that this instrument may be used routinely in the hypertension clinics.

REFERENCES

1. Kotchen TA. Hypertension control: trends, approaches, and goals. *Hypertension* 2007; 49(1):19-20.
2. Chobanian AV, Bakris GL, Black HR, Cushman WC, Green LA, Izzo JL Jr, et al; National Heart, Lung, and Blood Institute Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure; National High Blood Pressure Education Program Coordinating Committee. The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: the JNC 7 Report. *JAMA* 2003; 289(19):2560-72.
3. World Health Organization. The World Health Report 2002: Reducing Risks, Promoting Healthy Life. Geneva, Switzerland: World Health Organization 2002; 4: 57-8.
4. Altun B, Arici M, Nergizoglu G, Derici U, Karatan O, Turgan C, et al. Prevalence, awareness, treatment and control of hypertension in Turkey (the PatenT study). *J Hypertens* 2005;23(10):1817-23.
5. Arici M, Turgan C, Altun B, Sindel S, Erbay B, Derici U, et al. Hypertension incidence in Turkey (HinT): a population -based study. *J Hypertens* 2010;28(2):240-4.

6. Kaplan MS, Nunes A. The psychosocial determinants of hypertension. *Nutr Metab Cardiovasc Dis* 2003;13(1):52-9.
7. Levenstein S, Smith MW, Kaplan GA. Psychosocial predictors of hypertension in men and women. *Arch Intern Med* 2001;161(10):1341-6.
8. Kilic C. General Health Questionnaire: Validity and reliability. *Turkish Journal of Psychiatry* 1996;7(1):3-9.
9. Goldberg DP, Williams P. The User's Guide to the General Health Questionnaire. 1st ed. Windsor. NFR-NELSON 1988;2:20-35.
10. Patten SB, Williams JV, Lavorato DH, Campbell NR, Eliasziw M, Campbell TS. Major depression as a risk factor for high blood pressure: epidemiologic evidence from a national longitudinal study. *Psychosom Med* 2009;71(3):273-9.
11. Carroll D, Phillips AC, Gale CR, Batty GD. Generalized anxiety and major depressive disorders, their comorbidity and hypertension in middle-aged men. *Psychosom Med* 2010;72(1):16-9.
12. Rutledge T, Hogan BE. A quantitative review of prospective evidence linking psychological factors with hypertension development. *Psychosom Med* 2002;64(5):758-66.
13. Markovitz JH, Matthews KA, Kannel WB, Cobb JL, D'Agostino RB. Psychological predictors of hypertension in the Framingham Study. Is there tension in hypertension? *JAMA* 1993;270(20):2439-43.
14. Jonas BS, Franks P, Ingram DD. Are symptoms of anxiety and depression risk factors or hypertension? Longitudinal evidence from the National Health and Nutrition Examination Survey I Epidemiologic Follow-up Study. *Arch Fam Med* 1997;6(1):43-9.
15. Xie X, Yu G, He J. Influences of psychosocial factors in the treatment of the elderly patients with hypertension. *Chin J Geriatr* 2003;22(1):389-91.
16. Hong W, Hang B, Liu J. A control study of effect of the psychosocial factors on the patients with hypertension. *Chine Mental Health J* 2000;14(5):318-20.
17. Steptoe A. Psychosocial factors in the development of hypertension. *Ann Med* 2000;32(5):371-5.
18. Ames SC, Jones GN, Howe JT, Brantley PJ. A prospective study of the impact of stress on quality of life: an investigation of low income individuals with hypertension. *Ann Behav Med* 2001;23(2):112-9.
19. Waldstein SR, Jennings JR, Ryan CM, Muldoon MF, Shapiro AP, Polefrone JM, et al. Hypertension and neuropsychological performance in men: interactive effects of age. *Health Psychol* 1996;15(2):102-9.
20. Çelik C, Özdemir B. [Psychological factors in essential hypertension]. *Current Approaches in Psychiatry* 2010;2(1):52-65.
21. Pickering TG. Now we are sick: labeling and hypertension. *J Clin Hypertens (Greenwich)* 2006;8(1):57-60.
22. Rostrup M, Kjeldsen SE, Eide IK. Awareness of hypertension increases blood pressure and sympathetic responses to cold pressor test. *Am J Hypertens* 1990;3(12 Pt 1):912-7.
23. Rostrup M, Mundal HH, Westheim A, Eide I. Awareness of high blood pressure increases arterial plasma catecholamines, platelet norepinephrine and adrenergic responses to mental stress. *J Hypertens* 1991;9(2):159-66.
24. Davidson K, MacGregor MW, MacLean D. Anxiety, hostility, anger expression, and blood pressure in a population-based sample: the NSHS Study. *Ann Behav Med* 1988;20(Suppl):S78.
25. Wells KB, Rogers W, Burnam MA, Camp P. Course of depression in patients with hypertension, myocardial infarction, or insulin-dependent diabetes. *Am J Psychiatry* 1993;150(4):632-8.
26. Simonsick EM, Wallace RB, Blazer DG, Berkman LF. Depressive symptomatology and hypertension-associated morbidity and mortality in older adults. *Psychosom Med* 1995;57(5):427-35.
27. Davidson K, Jonas BS, Dixon KE, Markovitz JH. Do depression symptoms predict early hypertension incidence in young adults in CARDIA study? *Arch Intern Med* 2000;160(10):1495-500.
28. Yan LL, Liu K, Matthews KA, Daviglius ML, Ferguson TF, Kiefe CI. Psychosocial factors and risk of hypertension: the Coronary Artery Risk Development in Young Adults (CARDIA) study. *JAMA* 2003;290(16):2138-48.
29. Licht CM, de Geus EJ, Seldenrijk A, van Hout HP, Zitman FG, van Dyck R, et al. Depression is associated with decreased blood pressure, but antidepressant use increases the risk for hypertension. *Hypertension* 2009;53(4):631-8.
30. Yu G, Yang T, Borlongan CV, Stahl CE, Xie X, He J, et al. Influence of psychosocial factors on treatment of elderly Chinese patients with hypertension. *J Geriatr Cardiol* 2007;4(4):202-7.
31. Tennant C. Life stress and hypertension. *J Cardiovasc Risk* 2001;8(1):51-6.
32. Gold PW, Goodwin FK, Chrousos GP. Clinical and biochemical manifestations of depression. Relation to the neurobiology of stress (1). *N Engl J Med* 1988;319(6):348-53.
33. Delaney JA, Oddson BE, Kramer H, Shea S, Psaty BM, McClelland RL. Baseline depressive symptoms are not associated with clinically important levels of incident hypertension during two years of follow-up: the multi-ethnic study of atherosclerosis. *Hypertension* 2010;55(2):408-14.